

Behavioural interventions in selected public services

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Abstract: In order to gain a better understanding of human behaviour, Economics seeks to collaborate with other disciplines such as Psychology, Sociology, or Anthropology (Behavioural Economics). Unlike neoclassical economic theory, Behavioural Economics does not assume a rational individual. On the contrary, it focuses on an irrational individual while revealing what really influences their decisions and actions. Behavioural Economics focuses on factors that may result in someone saying "yes" to someone, while in other circumstances "no" may be a response to the same requirement. The paper presents partial outputs of the research project "Behavioural Interventions in Local Government: Increasing the Efficiency of Local Public Policies" which is focused on the creation and implementation of behavioural interventions in public policy as an important part of Behavioural Economics. The aim of the paper is to present a proposal of possible examples of "nudge" (behavioural intervention) in the form of an experiment by deep critical analysis in a selected public service in the municipality of Banská Bystrica reflecting the defined problems of delivering the service. Another aim of the paper is to present a proposal for the implementation of a selected example of "nudge" (behavioural intervention) in the form of an experiment in a selected public service. The paper defines the individual steps that need to be taken in the conditions of the selected public service, from the stage of analysis of the current situation to the identification of potential benefits (restrictions) related to the application of nudging and subsequently evaluates its importance in relation to individual actions, as well as resource efficiency (BASIC framework).

Points for Practitioners: The aim of the paper is to present a proposal of possible examples of selected behavioural intervention of public policy in the field of selected public services under the conditions of a selected municipality. Subsequently, the proposal will be improved thanks to the comments of the conference participants. This proposal can be an inspiration for local and regional policy makers in terms of saving resources (financial, material and human) as well as influencing change in citizens' behaviour.

Keywords: Behavioural Economics, nudge, public services

Introduction

Classical and neoclassical economic theory is based, or was based, on the assumption that individuals (people) are strictly rational, taking all circumstances into account in their decisions and acting to achieve their maximum benefit. However, real people do not fit into the theory of economic theory. According to Thaler (2017), mistakes are natural to people, they are influenced by prejudices, their social environment, and their decisions, far from what the classical and neoclassical economic theory implies, far from finding the ideal solution. In particular, the main cause of the difference is the inability to capture all the potential influences and aspects of individual decision-making (Downs, 1957). In contrast to the classical and neoclassical conception of a rational individual, there is a presumption of an irrational individual whose behaviour is not accidental and subject to irrational influences of the environment, or contextual effects such as emotions and feelings of near-sighted planning and many other sources (Ariely, 2009). Many decisions are based on the results of uncertain events, such as the results of the election, which profession is more dangerous, a police officer or fisherman, the value of the euro and so on. (Tversky, Kahneman, 1976). The result is mistakes that are predictable and always the same (concept of systematic prejudice - Tversky, Kahneman, 1976). In addition to private choice, it is necessary to perceive public choice, which limits existing sources. States have the capacity to produce and deliver different kinds of goods and services, but the scarcity of the sources forces them to make difficult decisions on the funding and feasibility of specific projects at different levels of government and self-government. For example, if a city decides to build a range of recreational services (tennis courts, parks, playgrounds), it does so at the expense of social services, educational services, due to limited public resources (Apgar, Brown, 1987, p. 85).

In the future, however, it will be necessary to limit states from basing their decisions on an economic theory based on the assumption of an objective individual who makes decisions on the basis of rational expectations and

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within their limited resources will always choose the best alternative (conditional optimisation - Thaler, 2017, p. 19). States need to reassess their decision-making on the assumption that these models are not an accurate description of human behaviour as envisaged in economic theory. Despite the recommendations, not all individuals will save for retirement exactly as much as necessary as all economists would, and therefore this analysis would result in "no reason to help people save because they know how to" (for example, by setting up a pension savings scheme), whereby we would lose the opportunity for more people to have something better (Thaler, 2017, p. 22). The aim should be to limit these policy decisions based on erroneous assumptions and focus, as stated by Thaler (2017), on seemingly irrelevant factors.

Such an individual concept is represented by behavioural economics (Ariely, 2009; Bernheim, Rangel, 2005; Crawford, 2006; Kahneman, Tversky, 1979; Myagkov, Plott, 1997; Thaler, Sunstein, 2010; Thaler, 2017) which attempts to explain human decisions based on psychological motives. Similarly, political economists are aware of the existence of personal motivations different from selfish interests associated with the concept of 'homo economicus' (Johnson, 1997, p. 29). An example is the explanation of altruistic behaviour based on economic analysis (Apgar, Brown, 1987).

Thaler and Sunstein (2010) present some kind of nudge that can help people achieve their own goals. They take into account an individual who does not behave as homo economicus but as an individual who is overconfident, makes extreme prognosis, is subject to contextual effects, favours the present and is to some extent irrational (Thaler, 2017). Application of liberal paternalism, or nudge, can, as already mentioned, help individuals achieve their goal, but with the difference that the individual has the choice to accept the solution. In practice, this means that when someone asks you for directions, you can precisely navigate them; i.e. you behave like a paternalist, but it is up to them as to whether or not they accept your help without hindering them in their final decision; i.e. you behave liberally (Thaler, Sunstein, 2010).

Changing people's behaviour (behavioural insights) is an important aim for policy-makers, municipalities, healthcare providers, educators, researchers etc. (Michie, Atkins, West, 2014). According to Hansen (2018) behavioural insight is an approach to policymaking that builds on lessons derived from behavioural and social science, including decision making, psychology, cognitive science, neuroscience, organizational and group behaviour. Changing ingrained behaviour patterns can be challenging. Even when we know what we are trying to achieve, we may lack the time, the multidisciplinary team, access to those whose behaviour needs to change, an understanding of behaviour change theories or the knowledge and skills relevant to changing behaviour (Michie, Atkins, West, 2014). Behaviourally-informed public policy is distinguished from traditional public policy making by (1) taking an inductive approach that is driven by experimentation and piloting, and (2) use of psychological theoretical underpinnings. Behavioural insights then challenge established assumptions of what is thought to be rational behaviour of citizens and businesses and use these findings to inform policies and regulation (Hansen, 2018).

1. Using behavioural insights to improve waste management and resource efficiency

The main aims of resource efficiency and waste management policy is to reduce, reuse and recycle waste, also known as 3R. The amount of waste can be reduced by introducing goods without packaging (e.g. a health and beauty shop) and a longer product life. Also, eco-friendly design will allow product reuse by replacing defective modular components. Waste should also be properly disposed of and sorted (e.g. avoiding littering) which incentivizes the reuse and recycling of waste material (OECD, 2017).

Consumer behaviour in this case is subject to several behavioural biases. One is the power of status-quo. Individuals have a strong tendency to adhere to the status quo, respectively to pre-set options (Thaler, Sunstein, 2010). If something of an individual goes wrong, e.g. mobile phone, the solution is not to repair it (if repair services for broken mobile phones are not common), but to purchase a new mobile phone instead of extending the life of the original phone.

Another reason for low resource efficiency is, for example, the unintuitive design of waste bins. Their design is often the by-product of complex waste sorting regulations; thus, correctly sorting waste requires a conscious effort rather than an automatic, effortless act (OECD, 2017). Based on an experiment, Duffy and Verges (2009) found that the colour resolution of wastebaskets contributed to a 34% increase in recycling. Cialdini (2016) states that the factor that ultimately attracts the attention of the individual, or most likely to determine the choice of the individual, is the one to which attention is drawn at the moment of decision-making. According to Cialdini (2016), it is not essential to change the views, attitudes or experiences of an individual. When being asked a

question or making a decision, what the individual is paying attention to is important. It is important to realize that not every attention is conscious (Fang, Singh, Ahluwalia, 2007; Mandel, Johnson, 2002;) and often when an individual is making a decision, their attention can be attracted by incentives such as a symbol of money or comfort (Mandel, Johnson, 2002) or an advertising banner (Fagh, Singh, Ahluwalia, 2007) etc. According to the OECD (2017), littering is influenced both by attitude-behaviour gaps (whereby individuals do not see correct waste disposal as a necessary civic duty), by miscalculation of the consequences of littering (both personal, e.g. being fined, and public, e.g. generating an environmental externality in the form of unregulated dumpsites) and by negative social norms (whereby individuals can be “incentivised” to litter if they see everyone else doing so). If you want individuals to respect a certain rule, it is a good strategy to inform them, of course, if it is true that most people respect that rule (Cialdini, 2009). An example of the use of social standards is the re-use of hotel towels, where the hotel informs guests about the behaviour of other hotel visitors and about their "recycling", or reusing towels (Cialdini, 2003; Goldstein et al., 2008). In general, women are more compassionate, empathetic and more careful than men (Willer et al., 2013), but more vulnerable to abuse, in the sense of their confidence being undermined. If a woman's trust is undermined or not trusting some news and who is disseminating the news, or the individuals who the news concerns (e.g. if a woman does not believe that other individuals will voluntarily recycle waste, she will ultimately not also recycle the waste - Irwin et al., 2015), i.e. ceases to cooperate (Kanagaretnam et al., 2009; Kuwabara, 2005; Slonim, Guillen, 2010; Snijders, Keren, 2001). It also appears that the fulfilment of obligations becomes more effective if an individual incurs a breach of costs, not necessarily merely financial costs (e.g. damage to reputation due to incorrect sorting of waste) (Dolan et al., 2009).

Behavioural insight can influence resource efficiency and waste management policy in several ways. If local authorities use intuitive, colour-coded collection waste containers, waste recycling may increase as a result of properly directing the individual's attention. According to the OECD (2017), making recycling more salient, e.g. through door-to-door waste collection in transparent trash bags, can help activate social norms in this context. It can also significantly influence the behaviour of individuals providing feedback on the amount of waste produced – both in absolute terms and relatively to meaningful benchmarks – would make the cost and benefit of waste collection more salient, and could be paired with commitment devices.

2. Methodology

The aim of the paper is to present a proposal of possible examples of "nudge" (behavioural intervention) in the form of an experiment by deep critical analysis in a selected public service in the municipality of Banská Bystrica reflecting the defined problems of delivering the service.

The paper defines the individual steps that need to be taken under the conditions of the selected public service, from the stage of analysis of the current situation to the identification of potential benefits (restrictions) related to the application of nudging and subsequently evaluates its importance in relation to individual actions, as well as resource efficiency (BASIC framework).

The article is the output of the APPV Behavioural Interventions in Local Government project, which focuses on bottlenecks in the field of public service provision, such as: maintenance of roads, maintenance of public spaces, functioning of municipal police, collection and removal of municipal solid waste, but also auxiliary services such as management and maintenance of buildings, recruitment and motivation of employees. The project is being developed by three Slovak universities (Comenius University, Matej Bel University and University of Economics) in four cities and towns, i.e. Banská Bystrica, Bratislava, Hlohovec and Prievidza. The project results should be applicable not only in selected municipalities, but the project aims to prepare a manual for all cities, towns and villages in Slovakia serving for the application of behavioural knowledge.

We will apply the BASIC framework to the local public service for the collection and removal of municipal solid waste (MSW collection and removal). The selection of the service where we will conduct the behavioural intervention was preceded by the mapping of the Banská Bystrica agenda and the subsequent mapping of the opportunities in Banská Bystrica, which took place between November 2019 and January 2020. Opportunity mapping was aimed at finding areas (playgrounds, parking, greenery maintenance, event promotion, illegal advertising, zero waste at cultural and sporting events, advertising space, vandalism, non-payers of taxes and fees and lack of citizens' preparedness in building proceedings) where the behavioural approach can be applied, i.e. a behavioural orientation approach (liberal paternalism), but without pressure from local self-government (state paternalism). One of these areas was the collection and transport of solid municipal waste, which we chose

as an object of analysis based on the designation of the city of Banská Bystrica as a priority, but also as one of the most problematic services whose quality of implementation is significantly influenced by citizens.

In mapping the agenda of the local self-government, we carried out a textual analysis of documents and information of the town of Banská Bystrica published on the town's website.

After mapping the local self-government from the documents of the city of Banská Bystrica, we sent a questionnaire to the deputy head of the town hall with prepared questions concerning the implementation of the city agenda and problems that the city encounters in their implementation. After receiving the completed questionnaire, interviews were conducted with selected departments, identified on the basis of an interview with the aforementioned deputy head and the project team of the Faculty of Economics, MBU.

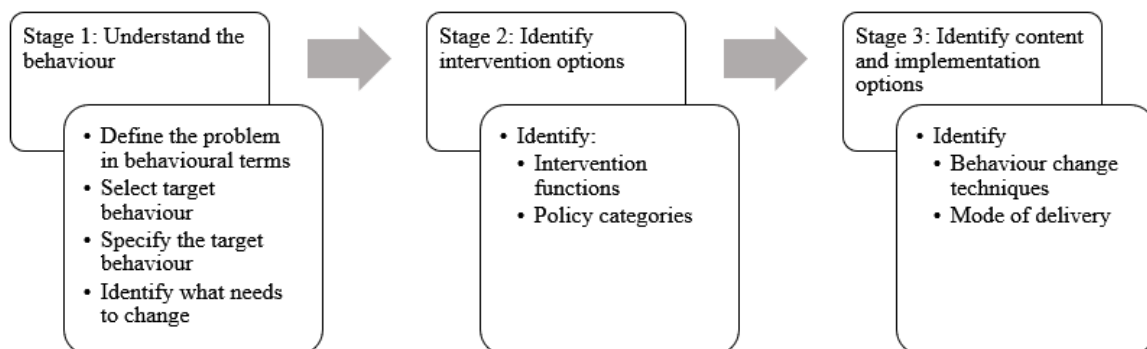
The interviews with the city representatives were structured as follows: 1) presentation of the project and project team, 2) presentation on behavioural interventions and, for a better understanding, a presentation of interventions at home and abroad, 3) project benefits for the city and for local self-government and 4) discussion.

BASIC framework – the Behavioural Insights Toolkit & Ethical Guidelines has been developed by the OECD in partnership with Dr. Pelle Guldborg Hansen of Roskilde University, Denmark. According to Hansen (2018), BASIC provides an overarching framework for applying behavioural insights to public policy from the beginning to the end of the policy cycle. BASIC framework is a simple set of five sequential stages for applying behavioural insights to public policy. The BASIC process begins by taking time to consider the political, institutional and policy context where the potential initiative is expected to take place. The political context, and the extent to which political leaders are aware of the use of behavioural insights and have been briefed on the actual and potential applications. Institutional context, including co-ordination with key departments and institutions that could contribute to and benefit from a behaviourally-informed initiative and policy context, with particular attention to ongoing policy initiatives and the extent to which a behaviourally-informed approach can inform existing policies (Hansen, 2018).

It is also important to consider key principles such as defining the problem, pinpointing the policy objective that the initiative could help achieve, identifying the data and information needed to define the problem and design solutions, lining up possible intervention / insights and considering the potential impact of intervention (Hansen, 2018).

BASIC framework consists of five stages, which are: B – Behaviour, A – analysis, S – strategies, I –intervention and C – Change. So far in our case we have implemented stages 1 and 2. Stage1 deals with applying behavioural insights at the beginning of policy cycle so as to target crucial behavioural problems versus a systemic issue whereas stage 2 deals with analysis of the target behaviours as viewed through the lens of BI. The first and second stages result in the third stage, Strategies, that provides guidelines for the practitioner to identify, conceptualise and design behaviourally informed strategies based on behavioural analysis. According to Michie, Atkins and West (2014), defining the problem in behavioural terms means being specific about 1) the target individual, group or population involved in the behaviour and 2) the behaviour itself (Figure 1). Before we start creating alternatives to the problem, we need to define exactly what behavioural problem we want to solve. If the problem is not well defined, the proposed intervention may not be effective either (Figure 1).

Figure 1: Define the problem in behavioural terms

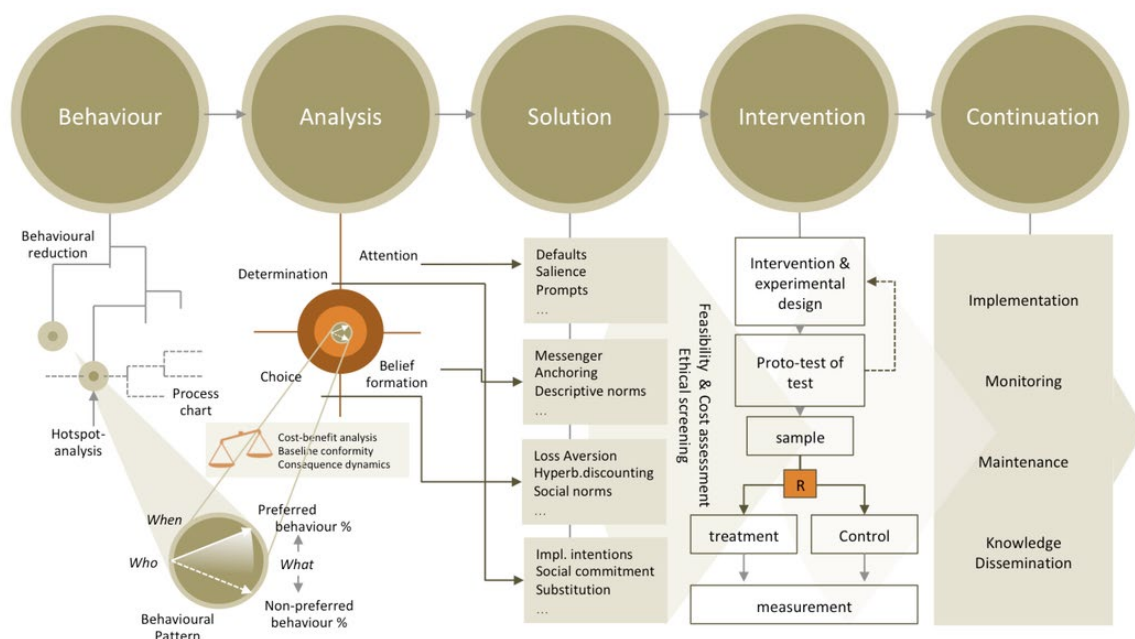


Source: Michie, Atkins, West, 2014, p. 31.

This means that in the case of local service the collection and transport of MSW is not the problem itself, e.g. the amount of waste removed or the low amount of waste separated as a result of an improper separation method, but how the amount is generated. The main problem in this case is to identify whether households separate waste, whether they can minimize separated waste, or whether they use a collection yard or are influenced by status-quo power.

The nature and specificity of the behavioural target will be important in determining how far the problem of waste management is solved. Suppose we would like to increase the amount of separated waste at the local service for the collection and removal of MSW. For example, we would choose a simple nudge, such as changing the 'what belongs in the waste bin' label from written to pictorial, which, although it is a very nice intervention, the real problem may be elsewhere. In order to correctly identify the problem, it is necessary to use behavioural reduction, i.e. which can affect the amount of separate waste, thereby creating smaller categories of problems. This may be inappropriately separated waste, e.g. for plastic bottles the air has not been let out of the bottle, residents do not have space in their apartment for waste separation, distance to the separated collection containers, regularity of collection of separated waste, size of separated containers, etc. Despite defining smaller categories of problems, these problems are still too big and therefore we have to break them down into concrete behaviour. With the distance to the collecting bins for separated waste we can either change the arrangement of collecting bins or we can increase their number, or we can motivate residents to separate by promoting a healthy lifestyle by developing activities such as walking. From these problems we choose the one that we can realistically solve in terms of feasibility, cost, replicability and measurability. The behavioural problem is finally defined by ABC = Agent - Behaviour - Context, where the agent represents the people whose behaviour we want to change, citizens of Banská Bystrica, we divide the behaviour into desired and unwanted behaviours and in the first step we try to find out how many percent of the population separates waste and how many percent of the population does not separate waste. The context represents the environment and the moment we begin to implement the intervention (Figure 2).

Figure 2: BASIC process



Source: Hansen, 2018

In the fourth stage, Intervention, the core methods for systematically designing and evaluating the efficacy and reception of behavioural interventions are presented, and the last stage, Change, provides practitioners with tools for 1) checking whether the initial assumptions and contextual factors have evolved before rolling out a BI-informed intervention; 2) producing plans for implementation, scale, monitoring, evaluation, maintenance and dissemination of applications (Hansen, 2018).

3. Results and discussion

Part of the first stage B - behaviour is to reveal the behaviour of individuals, or residents of Banská Bystrica regarding waste management policy.

In the first stage of the BASIC framework it is necessary to identify the main problems of the monitored entity, in our case the city of Banská Bystrica. In particular, we focused on waste management activities provided by the Department of Waste Management and Maintenance of Public Spaces. The department is responsible for municipal waste management in accordance with the legislation in force, adheres to the City Waste Management Program, issues opinions on municipal waste and small construction waste management, controls waste management and keeps records of waste, ensures monitoring of environmental measures (groundwater) and is responsible for operation of separated waste collection.

In the city there is external provision of collection and removal of municipal waste (MW). The current supplier to ensure the management of municipal waste in the city (Marius Pedersen, a. s.) was selected by public procurement of services in accordance with the applicable legislation (from 01.08.2019). The change of supplier occurred due to the termination of contractual relations for the activity in question with the previous service suppliers (31.07.2019).

The city has developed the Waste Management Program of the City of Banská Bystrica for the years 2016-2020, which is the program document defining the direction of the development of waste management at the city level for the set period. It has also prepared the General Binding Regulation of the City of Banská Bystrica No. 9 / 2016 on the management of municipal waste and small construction waste and the Program of Economic and Social Development of the City of Banská Bystrica for the years 2015 to 2023.

Within the territory of the city of Banská Bystrica, separated collection is provided for plastics, paper and cardboard, glass, metals, multi-layer composite materials based on cardboard - so-called tetra pak, biodegradable waste, electrical waste, batteries, municipal waste containing harmful substances, clothing and textiles and other types of municipal waste, through municipal waste collection bins or collection yards or city residents can take separated municipal waste to municipal waste collection centres, or can hand it in to the mobile purchase unit. In 2018, the level of municipal separated waste within the city territory was 55.50%, including mobile collection and "permanent brick-built" collection in the city territory (Internal documents of Banská Bystrica, 2019).

The problem of the city is mainly insufficiently minimized separated municipal waste, such as paperboard - cardboard and plastic bottles, but also others, which inefficiently occupy the collection capacity in the collection containers, resulting in quickly filled containers and further similar waste is either left next to the containers (polluting public areas) or put in containers for mixed municipal waste (landfill waste).

Banská Bystrica has one collection yard. The city sees a problem in the reluctance of residents to use this yard, as it is necessary for them to arrange their own transport.

Banská Bystrica made use of financial support from the European Union Cohesion Fund to introduce separate collection of metals and biodegradable household waste in the city. Two large landfills in Roma settlements were also removed within the framework of support from the Environmental Fund. Despite the efforts of self-government (information campaigns) there is a lack of discipline among the population.

The annual costs, including the spring-cleaning activity of the city, amount to about 50,000 € / year (City budget Banská Bystrica, 2019). The number of workers involved is neither registered nor evaluated. The removal of pollution from public areas is provided by activation workers; the city does not register costs separately. Bulky waste, biodegradable waste and small construction waste are most often present in contaminated mixed municipal waste. Sporadically, the pollution of public spaces is manifested in the whole urban area of the city, rural areas are no exception. Most often this is where there is the densest development and vice versa on the periphery, respectively on the outskirts of the city.

Rubbish bins are located at public transport stops, in the central urban zone, on playgrounds and in parks, i.e. in places with dense movement of people or where people remain in public areas for longer periods of time.

Table 1: Identification of problems in the local public service collection and removal of MSW, subject to the Department of Waste Management and Maintenance of Public Spaces in Banská Bystrica

Problem	Problem description	The solution of the city
Waste	Pollution around waste containers with oversized waste, or paper (cardboard boxes) as a result of no access to containers due to inappropriate car parking.	Change of waste containers, new supplier. Written call for citizens' councils, housing communities.
	Waste disposal outside designated areas prohibited.	New vertical signs forbidding waste disposal outside the designated areas.
	The problem is to minimise waste volume, especially cardboard boxes. Inhabitants of the city do not minimize their waste.	New information stickers on waste bins for plastics.
	Blocked toilets as a result of flushing away damp cloths.	The city did not solve the problem.
	Residents' unwillingness to use a collection yard and subsequent complaints that there is a mess around the waste containers.	Change opening hours.

Source: Author's own

By textual analysis of Banská Bystrica documents, questionnaire analysis and interviews with representatives of the municipal authority, we identified several areas in which behavioural interventions can be implemented.

Table 2: Mapping od opportunities in Banska Bystrica

Problem	Suggested area	Feasibility	Cost	Replicability	Measurability
Waste disposal outside designated areas	There are illegal dumps or rubbish on the street such as chewing gum, cigarette ends and so on.	Medium - cooperation between department of waste management and maintenance of public areas is required (based on complaints searching for places with illegal landfills), activation workers and mayor's office (odkazprestarostu.sk).	Medium to low depending on the intervention - when determining the payment assessment for waste it is possible to realize the intervention, i.e. paper and printing costs are needed, the city can share the costs, the cost of marking the distance to the nearest waste container, the cost of marking chewing gum, or the cost of special containers.	High - many municipalities in Slovakia have a similar problem so the same methodology can be used in other towns.	High - the city has data from odkazprestarostu.sk, complaints or the TrashOut application, location of activation workers in the city.
Pollution around waste containers	If it becomes impossible to remove waste (e.g. caused by inappropriate parking), waste accumulates around the waste containers.	High - cooperation between the department of waste management and maintenance of public greenery and the waste collection company.	Low - when determining the payment assessment for waste it is possible to carry out intervention, i.e. paper and printing costs are needed, the city is able to share the costs, or change the marking on the waste containers, i.e. sticker costs.	High - many municipalities in Slovakia have a similar problem so the same methodology can be used in other towns.	High - the city has data available.
Minimising waste size	Some types of separated waste are not minimised (e.g. cardboard boxes).	High - cooperation between the department of waste management and maintenance of public greenery and the waste collection company.	Low - when determining the payment assessment for waste it is possible to carry out intervention, i.e. paper and printing costs are needed, the city is able to share the costs, or change the marking on the waste containers, i.e. sticker costs.	High - many municipalities in Slovakia have a similar problem so the same methodology can be used in other towns.	High - the city has data available.
Failure to use the waste collection yard	Residents have the opportunity to use the collection yard, which has a one-shift operation with working hours Monday to Friday from 8.30 a.m. to 5.30 p.m. and Saturday from 8.30 a.m. to 5.00 p.m. Paper, plastics, glass, metals, multilayer composite materials on the basis of cardboard - so-called Tetra paks, bulky waste, wood, biodegradable waste and edible oils and fats can all be handed over to the collecting yard free of charge as part of the municipal waste fee. Despite these conditions, residents are not willing to take waste to the collection yard. For a quantity charge of € 0.02 / 1 kg of waste, small construction waste can be handed over at the collection point.	High - cooperation between the department of waste management and maintenance of public greenery and the waste collection yard.	Low - when determining the payment assessment for waste it is possible to carry out intervention, i.e. paper and printing costs are needed, the city is able to share the costs, or change the marking on the waste containers, i.e. sticker costs.	Medium - it is possible that many municipalities in Slovakia have a similar problem so the same methodology can be used in other towns.	Medium - the city has data on the use of the collection yard and data on the number of necessary trips in the cases of non-removal of waste due to e.g. incorrect parking.

Source: Author's own

Our target group for individual problems are the inhabitants of Banská Bystrica.

Despite the fact that the city increases the motivation of the inhabitants regarding waste separation through information activities, renewal and extension of the collection infrastructure, the responsiveness of the inhabitants is low. The city explains that the separation of waste reduces the costs of waste management (WM) and thus the fee for the removal of municipal waste and small construction waste. The city uses all available means of communication - Radničné noviny (Town Hall Magazine), distributed once a month to each household, the website of the city, press releases, providing interviews to the media, engaging in discussions, distributing leaflets, participating in discussions (Ekotopfilm, radio, local TV) and promoting environmental education in waste separation in kindergartens and primary schools.

In most cases, behavioural biases are a problem. According to Mullainathan and Thaler (2000), behavioural biases can be grouped into three categories (bounded rationality, bounded willpower and bounded self-interest), depending on behavioural deviation from the characteristics of homo economics (Table 3).

Table 3: Reasons for low waste separation

Behavioural biases	Problem	Descriptions	Solutions
Bounded rationality	Framing effect	Individuals can draw different conclusion from the same amount of information, depending on how it is presented and the relative salience of its elements	E.g. what is the colour resolution of the waste containers? When separating waste what draws the attention of the individual? Is there a guide to minimising waste?
	Loss aversion	People have a subconscious resistance to loss that is greater than satisfaction from profit. For this reason, states should focus on presenting intervention, not as what individuals gain from its implementation, but what they could lose by not implementing it.	When paying a fee for the removal of municipal waste and small construction waste, individuals should be informed that the waste fee will continue to increase if they do not separate waste more.
Bounded willpower	Cognitive dissonances	This phenomenon leads to an attitude-behaviour gap, a mismatch between beliefs and concrete behaviours (Carlsson and Johansson-Stenman, 2012).	It is important to align the individual's idea of themselves with their specific behaviour. If we want to increase the separation of waste by an individual, we give them e.g. a document to sign committing themselves to increasing the amount of separated waste every year. By doing so, their expected behaviour becomes real.
	Myopia in intertemporal choices	Individuals tend to show time-inconsistent preferences when considering decisions characterised by time-varying discount rates. In other words, individuals with this type of preference would rather obtain one Euro today than one Euro tomorrow, but when presented with the choice between receiving one Euro in one year and the same amount in one year and one day, they will gladly wait an extra day (Gsottbauer and van den Bergh, 2011).	In practice, this would mean an immediate increase in the fee for the removal of waste and small construction waste until individuals increase the rate of waste separation when this value would decrease in the future.
Bounded self-interest	Social norms	Individuals are not motivated exclusively by their own utility. Individuals adapt their behaviour to that of others.	It means e.g. that other countries separate waste more or we have a higher fee for municipal waste than a similarly large city due to lower waste separation.

Source: Processed according to OECD, 2017

In the next section, we will focus on examples of nudge that increase the rate of waste separation among residents even though they are based on reasons that cause just a low rate of separation.

3.1. Nudge examples – Resolving the result

There are several solutions to eliminate illegal landfills, pollution around waste containers, minimise separate waste, or failure to use a collection point. The basis for choosing a suitable solution is knowledge of behavioural insight or behavioural biases.

In 2010, eight municipalities in the Netherlands participated in a project aimed at reducing littering in the immediate surroundings of waste containers. They tested six solutions that they monitored over a period of two weeks (OECD, 2017).

In the first solution, they used self-correction by self-reflection by placing a mirror next to the collection containers so that individuals could see themselves while throwing rubbish into the collection containers. The second solution, injunctive social norms, by placing a picture of a person littering next to waste containers alongside the request to behave in the right way by throwing bags of rubbish in the appropriate containers. The third solution, describes social norms, by placing a sign alongside the waste containers with the text “Help to keep it clean here: most people in neighbourhood do not litter around the containers”. In the fourth solution, monitoring and penalties, individuals were alerted that waste is monitored and improper separation can lead to a fine. The fifth solution, commitment and consistency: the foot-in-the-door approach encourages people to make a general commitment first (individuals have committed to keeping the neighbourhood clean) while giving them a specific indication in the form of a "keep the neighbourhood clean" mark. The last solution is setting the right norms, where keeping the environment clean is the result of more frequent waste disposal. The results of the experiment showed that three of the six solutions had a statistically significant impact on waste reduction and separation.

The descriptive social norm, intervention, led to a reduction in littering frequency from 50% to 30%; mechanisms based on monitoring and fines resulted in a reduction from 51% to 29% and commitment devices led to a reduction from 45% to 28%. For the remaining interventions, no significant effect was found.

Another way to contribute to the reduction of waste not only around the waste containers, but also generally on the street is to eliminate cigarette ends (Ballot bin). The Hubbub (2015), an English environmental charity organisation, designed a smart nudge in 2015. Instead of looking for somewhere to throw away a cigarette end and risking the cigarette end ending up on the street, individuals can engage in a buzzing quiz. The authors based the nudge on the knowledge that individuals like to be asked questions, like to answer questions and like to promote their opinion - it boosts morale, awakens the brain, and is much more engaging than being instructed. These could be questions like "What came first: The Hen or the Egg?"

Figure 3: Nudge aiming to reduce cigarette end littering – Ballot Bin



Source: The Hubbub, 2015

Within 6 weeks after the project was set up on Villiers Street in London there was a 20% decrease in cigarette end littering. The organisation offers the option to purchase a customized Ballot bin worth £ 230 - £ 247 + VAT depending on the method of hanging.

Another way to increase waste separation is the design of a social experiment carried out by Hansen (2011) in Copenhagen. As in the previous case, Hansen (2013) proceeded on the assumption that it may not always be easy for an individual to find a waste container as they rush to work or cross the street. As a result, instead of threats and fines, Hansen and his team (2013) used clues that represent a visible reminder to pedestrians who are not fully aware that they have thrown something away. The results of the experiment reduced the amount of waste on the street by 46%. The authors of the experiment (Hansen, 2013) used color differentiation of footprints, using blue footprints for glass separation and green ones for paper separation.

Figure 4: Nudge aiming to reduce wrappers on the street



Source: Stasinopoulos, 2019

Among other things, a pictorial representation of what can be placed in a given collection container can contribute to increased recycling. Instead of a written description, it is possible to choose a more prominent form of information, thus attracting the attention of the individual.

Another way in which households can be motivated to reduce waste and increase recycling rates has been reported by Milford et al. (2015). In their experiment, they used the influence of social standards on individuals' decisions by sending households a letter informing them of the total amount of waste and the amount of waste in comparable groups. The experiment consisted of one control group and two test groups. In the first test group, the experimenters focused on the amount of waste generated, while in the second group the experimenters focused on the amount of recycled waste and the degree of household separation. The experimenters addressed 6,006 households who received one of the four letters, while no control letters were received in the control group. To be included in one of the treatment groups or the control group, the households needed to pass the following inclusion criteria; (1) the household does not share waste bins with other households (e.g., cooperatives); (2) the household has not signed up for home composting; (3) more than 50 kg and less than 2,500 kg waste was collected from the household in both 2012 and 2013; and (4) waste was collected from the household at least once during the first quarter of 2012, and at least once during the last quarter of 2013 (Milford et al. 2015, p. 6).

In the first test group, the first letter contained information on the amount of waste produced (kg) in 2012/2013 and a comparison with the average amount of waste produced by households in another district. The letter also contained incentives to reduce waste and ways in which waste could be reduced and examples of good practice. The extended version of the first letter in the first test group contained information on the amount of waste produced and an additional page with possible waste reduction recommendations and the benefits of waste reduction. The second letter in the first test group contained the amount of waste produced between January and June 2013 and January to June 2014 and the average amount of waste generated in a similar household in another district. The letter contained an invitation to an online survey.

The first letter in the “recycle group” contained information on the amount of waste collected in 2012/2013 and the average amount of household waste collected in the same district in 2013. The extended version of the first letter contained incentives to increase the rate of waste separation and additional information such as how to increase waste separation and examples of recycling benefits. The second letter in the recycling group contained information on how to do your own waste separation and a comparison with the average household separation rate in the same district between January and June 2013 and January to June 2014. The letter included an invitation to an online survey. The results of the experiment showed that for the households which received the recycle letter the amount of residual waste decreased by 1.1 kg per month per household (Milford et al. 2015).

A suitable nudge method to increase the separation of waste by individuals is the different size of the waste collection containers. In the US, for example, the Pay-as-you-throw system works at the local government level, which is a good example for the implementation of psychological choice architecture and providing incentives for residents to recycle. The program allows residents to choose the size of garbage bin that best fits their needs. The smaller the bin, the less the resident pays (Nudge, 2011). A 90-gallon bin cost about twice the price of the smallest 30-gallon bin. It is therefore appropriate for individuals to choose a smaller container for municipal waste than for recycled waste.

Similarly, the amount of information that individuals have at their disposal can help to increase recycling rates for those who have not recycled waste so far (Schiller, 2011). The aim of the experiment conducted at the University of Pittsburgh was to increase the recycling rate. For two weeks, the experimenters placed large yellow lettering "Landfill" on the waste container and underneath it "Imperial, PA (17.3 Miles)". The placement of the labelling resulted in a 29% increase in recycling rates. The labelling informed individuals about two things; the place where their waste ends up and two, to inspire a certain local kinship. The experimenters hoped that by marking the current location of the landfill and being close to it, individuals could be negatively constrained and thus increase the recycling of their waste.

3.2. Nudge examples – Resolving the causes

The role of each local self-government, respectively public administration, should not only address the amount of separated waste, but also a way to reduce waste generation as such. Food consumption and waste is a large contributor to environmental and health issues such as climate change, high-obesity rates and land-use change (Nielsen et al., 2016). However, there are simple nudges to reduce food waste and the amount of waste produced which have huge economic benefits not only for the individual but also for the entire private and public spheres.

One such nudge is an experiment to change the size of the plates on which food is served. In 2015, an experiment was carried out in 52 hotels, of which 7 were a control group. In the first experiment, the plate size was reduced from 24 to 21 cm. By reducing the plate size, 19.5% of food was saved in the test group compared to the control group. In the second experiment, they also changed the size of the plate, but at the same time informed the hotel guests that they could visit the buffet table during meal serving. The combination of plate size reduction and social norm led to a 20.5% reduction in food waste (Kallbekken, Sælen, 2013).

The experiment was subsequently carried out in Denmark (Schmidt et al., 2013), when a 3 cm reduction in plate diameter contributed to a 26% reduction in food waste. The strategy presented in France during the Nudge Challenge 2017 was a similar experiment carried out (a student contest organised by Nudge France), when experimenters used salience to inform people about how much food is thrown away in a school canteen. They put up posters around the canteen saying how many kg of food and how many entire meals had been wasted the previous day. This form of push resulted in a 40% reduction in food waste over two days (NudgeFrance, 2017).

Another way to reduce the amount of waste produced was presented in an Italian restaurant, confronting individuals with the default option to have uneaten food packed to take away. There were tokens on the table that were red on one side and green on the other. The token was always placed with the green side up at the beginning, indicating to the operator that the customer wished to take away the leftovers. If the customer did not want to take away the food, they had to turn the token over so that the red side was up. Of the original 40% of home-takers, this number increased to 85% after the introduction of the tokens (Vaccaro, 2017).

A similar experiment was carried out in Greece where the aim of the experiment was to nudge customers to ask for a “foodie bag” in order to take the leftovers with them. The experimenters placed a notice on every table in a restaurant informing the customers that 1/3 of all processed food is wasted without being consumed. This means that 1.3 billion tons of food end up in waste containers every year. In Greece, 100 kg of food per person are

discarded on a yearly basis. The goal of the experimenters was to reduce the production of food waste and encourage sustainable food consumption whilst retaining a perfectly enjoyable dining experience. Customers could contribute to changing the amount of waste by asking for a “foodie bag”. The results of the experiment showed an increase in demand of 10.38% for a “foodie bag” (Nudge unit Greece, 2019).

Jague, Vyrastekova (2016) presented a behavioural intervention in a university restaurant, which consisted of an information campaign. The aim of which was to raise awareness of the problems associated with wasting food, and a nudge, namely a shortcut solution offered to the consumer to mitigate the insufficient planning problem. The campaign consisted of two types of posters.

Figure 5: Information campaign on food wastage issues, Poster 1 - Incorrect consumption planning, Poster 2 - Incorrect food planning related to social norms



Source: Jague, Vyrastekova (2016)

The first type of poster focused on the incorrect planning of food consumption by customers. It was designed to evoke an emotional response without any monetary stimulus. In the second case (Poster 2), individuals were to be influenced by psychological motifs accentuated by social emotions such as shame or guilt. The negative “Didn’t finish” report was combined with the “Next time: ask for a smaller portion!!!” solution. Individuals in this case were affected by the loss aversion, when the message on the poster was intended to evoke the loss of food waste, which can be considered a strong motive in the behaviour of individuals (Kahneman, Tversky, 1979). During the observed period, the requests for a smaller lunch increased from 3.5 to 6.0 percent (719 lunches were issued in the pre-intervention period and 1,437 lunches in the intervention period). The efforts of local self-government, respectively public administration, should support and reward innovative ideas, respectively local entrepreneurs who are looking for possibilities for waste elimination e.g. in one café in Banská Bystrica you can no longer buy takeaway coffee without your own mug, or street food is served on recyclable plates and with recyclable cutlery.

It can not only be a change in the behaviour of customers in restaurants, but also local self-governments and state should try to change the behaviour of households when buying food and the subsequent generation of waste.

Kameke and Fisher (2018) focused on reducing the amount of waste produced by following the food purchase plan. The questionnaire focused initially on whether individuals were responsible for shopping in their home, their attitude towards food waste reduction, shopping behaviour, barriers of purchase planning, proposed nudges and demographics. In the questionnaire they presented nudge as external meal planning and fee-based food ingredient delivery, tips on shopping planning via mail, email, app or internet platform, public promotion of food waste reduction by a respected person, regular suggestions for weekly meal planning, feedback on financial costs of the individual food waste produced, pictures that demonstrate the extent of the amount of wasted food, regular exchange about personal experiences on the reduction of food waste with friends and neighbours, reminders about using shopping plans in order to reduce food waste, a challenge on household food waste reduction with

a friend and feedback on the actual amounts of wasted food generated by the individual household. Kameke a Fisher (2018) found out that respondents react positively towards feedback on individual food waste behaviour (quantities and financial costs), specific advice on meal planning and social interaction on this topic with their communities. Langen et al. (2015), Dai et al. (2016) and Schmidt (2016) all came to a similar conclusion. Therefore, in the first case, they suggest focusing on the motivation of individuals to reduce waste by focusing on social exchange, meal planning advice and feedback on individual behaviour with the aim of solving barriers of purchase planning, forecasting meal demand, lack of creativity, lack of discipline, lack of time for planning, spontaneous change of plans and anticipation of preferences, so the result would be sound purchase planning (meal planning, shopping list and supply check).

4. Conclusion

The aim of the paper was to present a proposal of possible examples of "nudge" (behavioural intervention) in the form of an experiment by deep critical analysis in a selected public service in the municipality of Banská Bystrica reflecting the defined problems of delivering the service. The paper defined the individual steps that need to be taken under the conditions of the selected public service, from the stage of analysis of the current situation to the identification of potential benefits (restrictions) related to the application of nudging and subsequently evaluates its importance in relation to individual actions, as well as resource efficiency (BASIC framework). First of all, it is necessary to define a problem that we will solve by means of liberal paternalism, or nudge. The problem definition was preceded by the analysis of secondary data, the completion of the questionnaire and subsequent interviews with employees of the Banská Bystrica town hall. Based on the evaluation of the collected data, we have identified the area of waste management as a problem, namely an increase in the rate of waste separation. Before realising the behavioural intervention, it is necessary to know, among other things, the motives or causes of the behaviour of the inhabitants in the city. We have identified a number of reasons that can contribute to increasing the participation rate of residents in waste separation, such as bounded rationality, bounded willpower and bounded self-interest.

Based on these reasons, we then chose forms of push that could be implemented at the level of local self-government, respectively public administration. We first introduced solutions that lead to the solution of an already existing problem, i.e. the amount of waste separated and which only address the consequence and not the cause of the amount of waste generated. Of course, municipal waste generation and food waste is one of the most serious problems of our time. For this reason, we have focused on pushes that should address the causes, i.e. they should reduce the amount of waste generated not only in restaurants but also by individuals.

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